

# MOLD INSPECTION AND SAMPLING REPORT

*Centennial Housing – Aspen, Colorado*

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*Presented to:*

Mr. Travis Beard  
First Choice Properties & Management, Inc.

*Performed by:*

Mr. Steve Shurtliff  
DS Consulting, Inc.  
P.O. Box 6864  
Avon, CO 81620

*Project Details:*

DSC Project #: 1575  
Conducted: September 29, 2009

# PROJECT OVERVIEW

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## I. Introduction

A limited on-site inspection for visible mold growth and air sampling for indoor air quality was performed within portions of units within seven buildings of Centennial Housing in Aspen, Colorado on September 29, 2009 by Mr. Steve Shurtliff at the request of Mr. Travis Beard with First Choice Properties & Management, Inc. Mr. Shurtliff is a Certified Residential Mold Inspector by the Indoor Air Quality Association with DS Consulting, Inc (*see Appendix B for certification*).

The inspections and samplings were limited to portions of the units with each of the seven (7) buildings at Free Silver Ct. and Teal Ct. (*see section V for sample locations and descriptions*). The indoor air quality sampling was performed to assess air quality levels within portions of the sampled units when compared to the naturally occurring ambient levels outside (*see Appendix C for laboratory results*).

The visual inspections conducted on September 30, 2009 included only portions of the accessible units. A limited number of air samples were also taken within portions of the accessible units. An air sample was not taken from every visually inspected area. The units inspected and sampled were chosen because they were accessible on the date of the inspection.

## II. Description of Activities and Findings

### *Visual Inspection*

A limited inspection for visible mold growth was conducted throughout portions of several units within the seven (7) buildings of Centennial Housing in Aspen, Colorado. This inspection revealed significant amounts of visible mold growth on wood materials in many of the units. A significant amount of active mold growth was observed in varying degrees and locations on the plywood roof, rafters, and walls of the inspected units. The findings of the visual inspection on September 29, 2009 are as follows:

- Free Silver - Unit 125: The main level and attic were visually inspected. The main level of the unit contained no visible mold or signs of water intrusion. The rafters, roof plywood and all three walls in the attic had significant amounts of visible mold growth.
- Free Silver – Unit 222: The main level and attic were visually inspected. The main level of the unit contained no visible mold or signs of water intrusion. There was a small amount of visible mold growth on the north wall next to a vent within the attic.
- Free Silver – Unit 321: The main level, upper level, and attic were visually inspected. The main level of the unit contained no visible mold or signs of water intrusion. The upper level bathroom had a small amount of visible mold growth on the walls and ceiling. The attic revealed significant amounts of mold growth on the rafters, roof plywood and walls. Drywall on the east wall of the attic also showed signs of water intrusion.
- Free Silver – Unit 327: The attic was visually inspected and revealed no visible mold or signs of water intrusion.

- Free Silver – Unit 420: The main level and attic were visually inspected. The main level of the unit contained no visible mold or signs of water intrusion. The attic revealed a significant amount of mold growth on the rafters, roof plywood, and the north wall.
- Free Silver – Unit 423: The attic was visually inspected and revealed no visible mold or signs of water intrusion.
- Teal – Unit 225: The main level and attic were visually inspected and revealed no visible mold or signs of water intrusion.
- Teal – Unit 310: The unit was visually inspected and revealed no visible mold or signs of water intrusion.
- Teal – Unit 410: The unit was visually inspected and revealed no visible mold or signs of water intrusion.

### *Air Sampling*

Thirteen (13) total air quality samples were collected from the buildings of Centennial Housing in Aspen, Colorado on September 29, 2009. One (1) sample was collected outside and away from the buildings to get baseline levels of ambient air quality for the date and time of the inspection and sampling. Air samples were taken from varying locations within the units.

The air quality sampling results indicate that elevated airborne mold levels exist in four (4) of the units in which samples were taken. The total concentration of existing mold spores in these areas is considerably higher than the outdoor ambient concentration. In order to be considered “elevated,” airborne mold spore levels need to be **ten-times** higher or more indoors when compared to naturally occurring levels outside.

Levels of mold spores were present above this elevated level in the areas of each building as follows:

- Free Silver – Unit 125: An air sample was collected on the main level and attic of unit 125. The air sample collected from the main level of the unit showed elevated levels of the *smuts*, *Periconia*, *Myxomycetes* group of mold at 10.8 times greater than the outdoor sample.
- Free Silver – Unit 321: An air sample was collected on the main level, upper level, and attic of unit 321. The air sample collected from the upper level of the unit showed elevated levels of the *smuts*, *Periconia*, *Myxomycetes* group of mold at 10.8 times greater than the outdoor sample.

The air sample collected from the attic of the unit show elevated levels of the *smuts*, *Periconia*, *Myxomycetes* group of mold at 40.9 times greater than the outdoor sample, the *Penicillium/Aspergillus* group at 53.1 times greater than the outdoor sample, the *Basidiospores* group at 15.0 times greater than the outdoor sample, and the *Ascospores* group at 10.6 times greater than the outdoor sample.

- Teal – Unit 225: An air sample was collected on the main level of unit 225. The air sample collected from the main level of the unit showed elevated levels of the *smuts*, *Periconia*, *Myxomycetes* group of mold at 23.7 times greater than the outdoor sample.
- Teal – Unit 410: An air sample was collected within unit 410. The air sample collected from the unit showed elevated levels of the *smuts*, *Periconia*, *Myxomycetes* group of mold at 17.7 times greater than the outdoor sample.

### III. Structural Design

The buildings are wood-framed, multi-level, multi-unit buildings.

### IV. Sampling and Analytical Procedures

The survey and assessment were conducted by an Indoor Air Quality Association accredited Inspector qualified by experience, education, and training in the recognition and management of elevated indoor mold levels.

The survey was performed in accordance with Indoor Air Quality Association recommended procedures and approved sampling techniques. These procedures call for the visual inspection of certain areas of the building for suspect mold areas and the collection and analysis of representative samples of suspect areas.

A non-destructive building inspection was conducted. Walls, columns, perimeter pipe chases, and other inaccessible areas were not broken into in order to locate hidden mold. Insulation was not removed within the crawlspace to locate hidden mold. It should be noted that additional mold might be located in such inaccessible areas. Roofs and exterior areas were not included in the survey. As mold conditions can continuously change, the quantities and locations of mold identified in this report are approximations and subject to field verification. The results contained within this report are limited to the date and time the inspection was conducted.

A total of thirteen (13) air-quality samples were collected. DSC used a high-volume Thomas pump manufactured by Asbestos Analytics. Mr. Shurtliff calibrated the pump to 10.0 liters per minute with a high-volume rotameter prior to collecting the first air-quality sample. Each air-quality sample was collected by drawing air through Allergenco-D spore-trap cassettes for a total of 7 minutes per sample for a total volume of air equal to 70.0 liters per sample. The calibration of the pump was also checked after the last air-quality sample was collected.

Collected samples were analyzed by Aerobiology Laboratory Associates, Inc., a Colorado-State-Certified Microbiological Laboratory, with EMLAP Accreditation #102977. Analysis of the samples was performed on the “date reported,” as listed in the Aerobiology Laboratory sample-analysis report.

### V. Sample Locations and Descriptions

| SAMPLE # | SAMPLE TYPE | SAMPLE LOCATION                          | SAMPLE VOLUME |
|----------|-------------|--|---------------|
| Outside  | Air Sample  | Outside of Buildings                     | 70 Liters     |
| 321 Main | Air Sample  | Free Silver Court, Unit 321 – Main Level | 70 Liters     |

|            |            |   |           |
|------------|------------|---|-----------|
| 321 Upper  | Air Sample | Free Silver Court, Unit 321 – Upper Level | 70 Liters |
| 321 Attic  | Air Sample | Free Silver Court, Unit 321 – Attic       | 70 Liters |
| 327 Attic  | Air Sample | Free Silver Court, Unit 327 – Attic       | 70 Liters |
| 420 Main   | Air Sample | Free Silver Court, Unit 420 – Main Level  | 70 Liters |
| 420 Attic  | Air Sample | Free Silver Court, Unit 420 – Attic       | 70 Liters |
| 125 Main   | Air Sample | Free Silver Court, Unit 125 – Main Level  | 70 Liters |
| 125 Attic  | Air Sample | Free Silver Court, Unit 125 – Attic       | 70 Liters |
| 423 Attic  | Air Sample | Free Silver Court, Unit 423 – Attic       | 70 Liters |
| 225-T Main | Air Sample | Teal Court, Unit 225 – Main Level         | 70 Liters |
| 310-T Main | Air Sample | Teal Court, Unit 310 – Main Level         | 70 Liters |
| 410-T Main | Air Sample | Teal Court, Unit 410 – Main Level         | 70 Liters |

## VI. Inspector Comments

As some people are more susceptible than others to mold-related health problems due to factors such as age, relative overall health, allergies, existing respiratory ailments, etc., even small levels of mold spores can be potentially dangerous (*see Appendix A for a description of mold types*).

Some of the inspected units showed no visible mold, yet the air sample collected from the same area had elevated amounts of airborne mold spores. These units include unit 225 (Teal Court) and 410 (Teal Court). No visible mold was observed in any of the inspected areas of either unit, but the air samples show elevated levels of the *smuts*, *Periconia*, *Myxomycetes* group.

Other units had visible mold growth, but the air sample showed the levels of airborne spores were not elevated at the time of the sampling. These units would include the attic of unit 420 (Free Silver Court) and the attic of unit 125 (Free Silver Court). The reason for this could be that the mold has had time to dry out and become dormant, not releasing active spores during the time of the sampling, or that the air movement in the units was such that the contaminated air had been drawn out of the space being sampled. Most of the units sampled had doors and windows open when the inspection started aiding in a considerable amount of cross-ventilation in many of the units.

Response-action recommendations for mold spore counts are listed in the following section. Recommendations are either “immediate” or “general”. Immediate recommendations indicate an imminent hazard exists, and the hazard should be addressed as soon as possible.

## VII. Laboratory Analysis Explanation

For each sample, the first column is labeled “Raw Count.” This is the actual number of each mold spore found for the amount of air collected.

The next column, labeled “Spores/M<sup>3</sup>,” is mathematically extrapolated from the “Raw Count” column and the volume of air collected. For example, assume that one sample has collected 0.1 cubic meters of air, and one spore is found in that sample. Assuming an even distribution of spores, 1.0 cubic meter of air would then contain 10 spores.

## **VIII. Recommendations**

### **IMMEDIATE:**

Due to the existence of significant amounts of visible mold observed and the high levels of airborne mold spores present in the indoor air-quality samples collected from portions of the above-referenced buildings on September 29, 2009, it is recommended that mold remediation activities take place.

Thank you for choosing DS Consulting, Inc. We are proud to be your local indoor air quality consultants. We look forward to working with you in the future. Please do not hesitate to contact us with any questions or concerns regarding this report.

## APPENDIX A

### DESCRIPTION OF COMMON MOLD TYPES

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***Alternaria:*** One of the most common molds found worldwide in soil and on plants and can commonly be found indoors (frequently appearing black on window frames). It is an important airborne allergen and common agent for hay fever, asthma, and other allergy related symptoms.

***Amerospores:*** This is a general classification for non-descript, small, round spores which are unidentifiable by direct microscopic examination. They can include *Aspergillus* and *Penicillium*, among others.

***Anellophora/Taeniolella:*** The spores are dark brown and distinctive. Anellophora have areas of successive proliferations, whereas Taeniolella does not. No information is available regarding health effects, or toxicity. They may be identified on surfaces by tape lifts, tease mounts from bulk samples and in air by spore trap samples. These genera do not grow on common laboratory media. Natural habitat includes leaves, and wood. They are sometimes associated with lumber, and can be found indoors on wood, and plants.

***Ascospores:*** A large category of spores (produced in a sac-like structure) that are found everywhere in nature and include more than 3000 genera. Most Ascospores of health or IAQ importance are identified separately by their genus when possible on an IAQ report.

***Aspergillus/Penicillium:*** *Aspergillus* and *Penicillium* spores are indistinguishable via direct microscopic examination. *Aspergillus* tends to colonize on continuously damp materials such as damp drywall and fabrics. *Penicillium* is commonly found in house dust, on water-damaged wallpaper, behind paint and in decaying fabrics. It is one of the most common genera found worldwide in soil and decaying vegetation and indoors in dust, food, and various building materials. Common bread mold is a species of *Penicillium*. It is reported to be allergenic, to cause certain infections in compromised individuals, and some species do produce toxins unhealthy to humans.

***Basidiospores:*** Basidiospore is a general classification of spore that is commonly found in gardens, forests and woodlands. They are commonly found in outdoor air samples. Many species are reported to be allergenic and some species are associated with dry rot in wood. They are not potentially toxigenic.

***Chaetomium:*** A contaminant rarely involved in systemic and cutaneous disease and sometimes reported to be allergenic.

***Cladosporium:*** *Cladosporium* is not potentially toxigenic, but it can trigger an allergic reaction. It is a common outdoor mold that can colonize continuously damp materials. It is found everywhere, and is often the most common and numerous mold found in outdoor air. Indoor concentrations are usually not as high, but it is an important airborne allergen and common agent for hay fever, asthma, and other allergy related symptoms. It can thrive in various indoor environments, appearing light green to black.

***Pithomyces:*** Contaminant, found on decaying plants, especially leaves and grasses. Rarely found indoors, but it can grow on paper. No reports of allergies or infections, but some species produce a toxin that causes facial eczema in sheep.

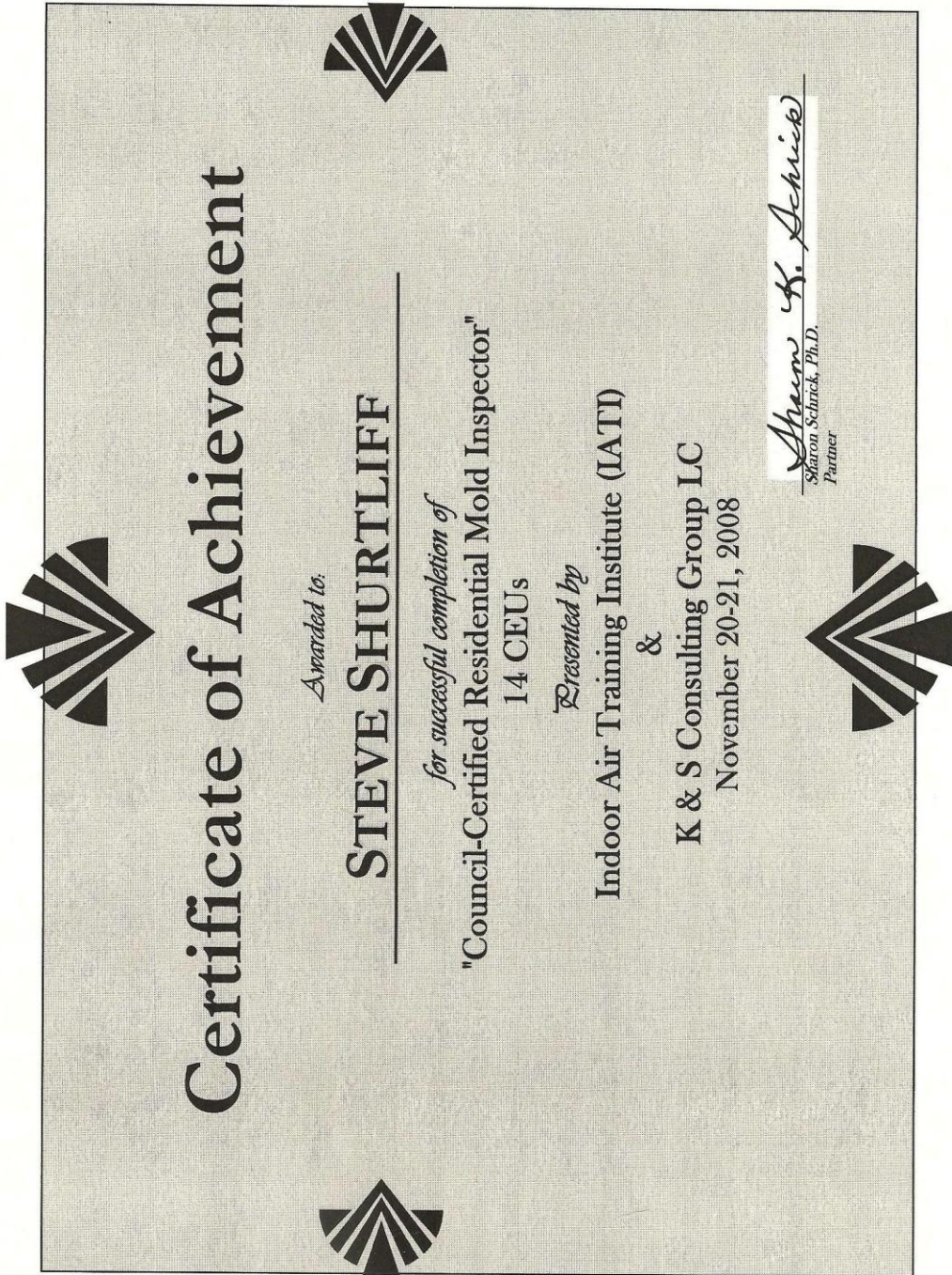
***Smuts/Myxomycetes/Periconia:*** General category for commonly found genera usually associated with living and decaying plants as well as decaying wood. Sometimes it can be found indoors. Some allergenic properties reported, but generally pose no health concerns to humans or animals.

***Stachybotrys***: *Stachybotrys* colonizes on continuously wet materials. It is potentially toxigenic. This is the type of mold often referred to as “Toxic Black Mold”. Reports connecting *Stachybotrys* with serious illness are highly controversial. The Center for Disease Control states on their website ([www.CDC.gov](http://www.CDC.gov)), that the level of exposure to any type of mold is more of a factor than the type of mold.

***Ulocladium***: Contaminant, found everywhere. Can grow indoors on various materials including paper, but requires more water than some other molds. It is reported to be a major allergen.



APPENDIX B  
CERTIFICATION



APPENDIX C  
LABORATORY ANALYSIS

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DS Consulting, Inc.  
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Lakewood, CO 80228  
Attn: Brandon Sinkbeil

**Client Project Name: Centennial-9/29/09**  
**Project ID: 095346**

Date Collected: 09/29/09  
Date Received: 09/30/09  
Date Reported: 10/01/09

Vertical Page 1 of 2      Horizontal Page 1

**Non-Viable Spore Trap Analysis**

| Client Sample Number          | Outside                                    |          |         |              | 321 Main                                    |          |         |              | 321 Upper                                     |          |         |              | 321 Attic  |          |         |              |
|-------------------------------|--|----------|---------|--------------|---|----------|---------|--------------|---|----------|---------|--------------|--|----------|---------|--------------|
|                               | Standard For 9/29/09                       |          |         |              | FS-Unit 321 Main Level                      |          |         |              | FS-Unit 321 Upper Level                       |          |         |              | FS-Unit 321 Attic  |          |         |              |
| Sample Location               |  |          |         |              |   |          |         |              |   |          |         |              |  |          |         |              |
| Sample Volume (litres)        | 70   |          |         |              | 70  |          |         |              | 70  |          |         |              | 70   |          |         |              |
| Lab Sample Number             | 095346-001                                 |          |         |              | 095346-002                                  |          |         |              | 095346-003                                    |          |         |              | 095346-004   |          |         |              |
| Spore Identification          | Raw C                                      | Spore/m3 | % Total | In/Out Ratio | Raw C                                       | Spore/m3 | % Total | In/Out Ratio | Raw C   | Spore/m3 | % Total | In/Out Ratio | Raw C  | Spore/m3 | % Total | In/Out Ratio |
| Alternaria                    | 2  | 29       | 3       | -            | 2   | 29       | 2       | 1.0/1        | 6   | 86       | 4       | 3.0/1        | 8  | 114      | 1       | 3.9/1        |
| ascospores                    | 3  | 43       | 4       | -            | 2   | 29       | 2       | 1/1.5        | 2   | 29       | 1       | 1/1.5        | 32   | 457      | 3       | 10.6/1       |
| basidiospores                 | 7  | 100      | 10      | -            | 40  | 571      | 32      | 5.7/1        | 33  | 471      | 20      | 4.7/1        | 105  | 1500     | 10      | 15.0/1       |
| Botrytis                      |  |          |         |              |   |          |         |              |   |          |         |              |  |          |         |              |
| Cladosporium                  | 33   | 471      | 49      | -            | 31  | 443      | 25      | 1/1.1        | 23  | 329      | 14      | 1/1.4        | 147  | 2100     | 14      | 4.5/1        |
| Drechslera/Bipolaris group    |  |          |         |              |   |          |         |              | 1   | 14       | 1       | -            |  |          |         |              |
| hyphal elements               | 9  | 129      | 13      | -            | 23  | 329      | 18      | 2.6/1        | 64  | 914      | 38      | 7.1/1        | 72   | 1029     | 7       | 8.0/1        |
| Oidium                        |  |          |         |              |   |          |         |              |   |          |         |              |  |          |         |              |
| Penicillium/Aspergillus group | 11   | 157      | 16      | -            | 9   | 129      | 7       | 1/1.2        | 15  | 214      | 9       | 1.4/1        | 583  | 8329     | 56      | 53.1/1       |
| Peronospora                   |  |          |         |              |   |          |         |              |   |          |         |              |  |          |         |              |
| Pithomyces                    |  |          |         |              | 1   | 14       | 1       | -            |   |          |         |              |  |          |         |              |
| rusts                         |  |          |         |              | 1   | 14       | 1       | -            | 1   | 14       | 1       | -            | 7  | 100      | 1       | -            |
| smuts,Periconia,myxomycetes   | 2  | 29       | 3       | -            | 16  | 229      | 13      | 7.9/1        | 22  | 314      | 13      | 10.8/1       | 83   | 1186     | 8       | 40.9/1       |
| Torula                        |  |          |         |              |   |          |         |              |   |          |         |              | 2  | 29       |         | -            |
| Trichocladium                 |  |          |         |              |   |          |         |              |   |          |         |              |  |          |         |              |
| Ulocladium                    |  |          |         |              |   |          |         |              | 1   | 14       | 1       | -            | 2  | 29       |         | -            |
| Ulocladium -like              |  |          |         |              |   |          |         |              |   |          |         |              |  |          |         |              |
| unknown                       |  |          |         |              |   |          |         |              | 1   | 14       | 1       | -            |  |          |         |              |
| Comments                      | <b>Debris Rating- 3*</b>                   |          |         |              | <b>Debris Rating- 4*</b>                    |          |         |              | <b>Debris Rating- 4*</b>                      |          |         |              | <b>Debris Rating- 4*</b>                                 |          |         |              |
|                               | <b>Analytical Sensitivity: 14</b>          |          |         |              | <b>Analytical Sensitivity: 14</b>           |          |         |              | <b>Analytical Sensitivity: 14</b>             |          |         |              | <b>Analytical Sensitivity: 14</b>                        |          |         |              |
|                               | Insects: ND, Particles: Many, Fibers: Few, |          |         |              | Insects: ND, Particles: Many, Fibers: Many, |          |         |              | Insects: Pres, Particles: Many, Fibers: Many, |          |         |              | Mod Pollen, Insects: Few, Particles: Many, Fibers: Many, |          |         |              |
| Totals                        | 67   | 958      | ~100%   | -            | 125   | 1787     | ~100%   | 1.9/1        | 169   | 2413     | ~100%   | 2.5/1        | 1041   | 14873    | ~100%   | 15.5/1       |

\* See "Footnotes and Additional Report Information" section for explanation of footnotes.

DS Consulting, Inc.  
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Lakewood, CO 80228  
Attn: Brandon Sinkbeil

**Client Project Name: Centennial-9/29/09**  
**Project ID: 095346**

Date Collected: 09/29/09  
Date Received: 09/30/09  
Date Reported: 10/01/09

Vertical Page 1 of 2      Horizontal Page 2

**Non-Viable Spore Trap Analysis**

| Client Sample Number          | 327 Attic                                    |          |         |              | 420 Main   |          |         |              | 420 Attic   |          |         |              | 125 Main  |          |         |              |
|-------------------------------|--|----------|---------|--------------|--|----------|---------|--------------|---|----------|---------|--------------|---|----------|---------|--------------|
|                               | FS-Unit 327 Attic                            |          |         |              | FS-Unit 420 Main Level                                   |          |         |              | FS-Unit 420 Attic   |          |         |              | FS-Unit 215 Main Level                                    |          |         |              |
| Sample Location               |  |          |         |              |  |          |         |              |   |          |         |              |   |          |         |              |
| Sample Volume (litres)        | 70   |          |         |              | 70   |          |         |              | 70  |          |         |              | 70  |          |         |              |
| Lab Sample Number             | 095346-005                                   |          |         |              | 095346-006   |          |         |              | 095346-007  |          |         |              | 095346-008  |          |         |              |
| Spore Identification          | Raw C  | Spore/m3 | % Total | In/Out Ratio | Raw C  | Spore/m3 | % Total | In/Out Ratio | Raw C   | Spore/m3 | % Total | In/Out Ratio | Raw C   | Spore/m3 | % Total | In/Out Ratio |
| Alternaria                    |  |          |         |              |  |          |         |              | 2   | 29       | 3       | 1.0/1        |   |          |         |              |
| ascospores                    |  |          |         |              | 3  | 43       | 4       | 1.0/1        | 4   | 57       | 6       | 1.3/1        | 10  | 143      | 4       | 3.3/1        |
| basidiospores                 | 5  | 71       | 9       | 1/1.4        | 15   | 214      | 19      | 2.1/1        | 14  | 200      | 22      | 2.0/1        | 30  | 429      | 12      | 4.3/1        |
| Botrytis                      |  |          |         |              |  |          |         |              |   |          |         |              |   |          |         |              |
| Cladosporium                  | 26   | 371      | 49      | 1/1.3        | 21   | 300      | 26      | 1/1.6        | 17  | 243      | 27      | 1/1.9        | 36  | 514      | 14      | 1.1/1        |
| Drechslera/Bipolaris group    |  |          |         |              |  |          |         |              |   |          |         |              |   |          |         |              |
| hyphal elements               | 11   | 157      | 21      | 1.2/1        | 25   | 357      | 31      | 2.8/1        | 12  | 171      | 19      | 1.3/1        | 46  | 657      | 18      | 5.1/1        |
| Oidium                        |  |          |         |              | 1  | 14       | 1       | -            |   |          |         |              | 9   | 129      | 4       | -            |
| Penicillium/Aspergillus group | 2  | 29       | 4       | 1/5.4        | 5  | 71       | 6       | 1/2.2        | 1   | 14       | 2       | 1/11.2       | 24  | 343      | 9       | 2.2/1        |
| Peronospora                   |  |          |         |              |  |          |         |              |   |          |         |              |   |          |         |              |
| Pithomyces                    |  |          |         |              |  |          |         |              |   |          |         |              |   |          |         |              |
| rusts                         |  |          |         |              | 1  | 14       | 1       | -            | 2   | 29       | 3       | -            | 79  | 1129     | 31      | -            |
| smuts,Periconia,myxomycetes   | 9  | 129      | 17      | 4.4/1        | 9  | 129      | 11      | 4.4/1        | 11  | 157      | 17      | 5.4/1        | 22  | 314      | 9       | 10.8/1       |
| Torula                        |  |          |         |              |  |          |         |              |   |          |         |              |   |          |         |              |
| Trichocladium                 |  |          |         |              |  |          |         |              |   |          |         |              |   |          |         |              |
| Ulocladium                    |  |          |         |              |  |          |         |              |   |          |         |              |   |          |         |              |
| Ulocladium -like              |  |          |         |              |  |          |         |              |   |          |         |              |   |          |         |              |
| unknown                       |  |          |         |              |  |          |         |              |   |          |         |              |   |          |         |              |
| Comments                      | <b>Debris Rating- 3*</b>                     |          |         |              | <b>Debris Rating- 3*</b>                                 |          |         |              | <b>Debris Rating- 3*</b>                                  |          |         |              | <b>Debris Rating- 4*</b>                                  |          |         |              |
|                               | <b>Analytical Sensitivity: 14</b>            |          |         |              | <b>Analytical Sensitivity: 14</b>                        |          |         |              | <b>Analytical Sensitivity: 14</b>                         |          |         |              | <b>Analytical Sensitivity: 14</b>                         |          |         |              |
|                               | Insects: Pres, Particles: Many, Fibers: Few, |          |         |              | Few Pollen, Insects: Few, Particles: Many, Fibers: Many, |          |         |              | Few Pollen, Insects: Pres, Particles: Many, Fibers: Many, |          |         |              | Mod Pollen, Insects: Pres, Particles: Many, Fibers: Many, |          |         |              |
| Totals                        | 53   | 757      | ~100%   | 1/1.3        | 80   | 1142     | ~100%   | 1.2/1        | 63  | 900      | ~100%   | 1/1.1        | 256   | 3658     | ~100%   | 3.8/1        |

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Date Collected: 09/29/09  
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Vertical Page 1 of 2      Horizontal Page 3

**Non-Viable Spore Trap Analysis**

| Client Sample Number          | 125 Attic   |          |         |              | 423 Attic   |          |         |              | 225-T Main                                  |          |         |              | 310-T Main  |          |         |              |
|-------------------------------|---|----------|---------|--------------|---|----------|---------|--------------|---|----------|---------|--------------|---|----------|---------|--------------|
|                               | FS-Unit 215 Attic                                       |          |         |              | FS-Unit 423 Attic                                       |          |         |              | TC-Unit 225 Main Level                      |          |         |              | TC-Unit 310 Main Level                                    |          |         |              |
| Sample Location               |   |          |         |              |   |          |         |              |   |          |         |              |   |          |         |              |
| Sample Volume (litres)        | 70  |          |         |              | 70  |          |         |              | 70  |          |         |              | 70  |          |         |              |
| Lab Sample Number             | 095346-009  |          |         |              | 095346-010  |          |         |              | 095346-011                                  |          |         |              | 095346-012  |          |         |              |
| Spore Identification          | Raw C   | Spore/m3 | % Total | In/Out Ratio | Raw C   | Spore/m3 | % Total | In/Out Ratio | Raw C                                       | Spore/m3 | % Total | In/Out Ratio | Raw C   | Spore/m3 | % Total | In/Out Ratio |
| Alternaria                    |   |          |         |              |   |          |         |              | 1   | 14       | 1       | 1/2.1        | 16  | 229      | 9       | 7.9/1        |
| ascospores                    | 2   | 29       | 3       | 1/1.5        | 1   | 14       | 2       | 1/3.1        | 3   | 43       | 2       | 1.0/1        | 4   | 57       | 2       | 1.3/1        |
| basidiospores                 | 17  | 243      | 21      | 2.4/1        | 9   | 129      | 19      | 1.3/1        | 28  | 400      | 20      | 4.0/1        | 9   | 129      | 5       | 1.3/1        |
| Botrytis                      |   |          |         |              |   |          |         |              |   |          |         |              | 4   | 57       | 2       | -            |
| Cladosporium                  | 17  | 243      | 21      | 1/1.9        | 13  | 186      | 28      | 1/2.5        | 16  | 229      | 11      | 1/2.1        | 94  | 1343     | 53      | 2.9/1        |
| Drechslera/Bipolaris group    |   |          |         |              |   |          |         |              |   |          |         |              |   |          |         |              |
| hyphal elements               | 20  | 286      | 25      | 2.2/1        | 13  | 186      | 28      | 1.4/1        | 39  | 557      | 28      | 4.3/1        | 22  | 314      | 12      | 2.4/1        |
| Oidium                        |   |          |         |              |   |          |         |              |   |          |         |              |   |          |         |              |
| Penicillium/Aspergillus group | 11  | 157      | 14      | 1.0/1        | 1   | 14       | 2       | 1/11.2       | 5   | 71       | 4       | 1/2.2        | 4   | 57       | 2       | 1/2.8        |
| Peronospora                   |   |          |         |              |   |          |         |              |   |          |         |              | 5   | 71       | 3       | -            |
| Pithomyces                    |   |          |         |              |   |          |         |              |   |          |         |              |   |          |         |              |
| rusts                         | 2   | 29       | 3       | -            | 1   | 14       | 2       | -            | 1   | 14       | 1       | -            |   |          |         |              |
| smuts,Periconia,myxomycetes   | 11  | 157      | 14      | 5.4/1        | 9   | 129      | 19      | 4.4/1        | 48  | 686      | 34      | 23.7/1       | 19  | 271      | 11      | 9.3/1        |
| Torula                        | 1   | 14       | 1       | -            |   |          |         |              |   |          |         |              |   |          |         |              |
| Trichocladium                 |   |          |         |              |   |          |         |              |   |          |         |              |   |          |         |              |
| Ulocladium                    |   |          |         |              |   |          |         |              |   |          |         |              |   |          |         |              |
| Ulocladium -like              |   |          |         |              |   |          |         |              |   |          |         |              |   |          |         |              |
| unknown                       |   |          |         |              |   |          |         |              |   |          |         |              |   |          |         |              |
| Comments                      | <b>Debris Rating- 3*</b>                                |          |         |              | <b>Debris Rating- 3*</b>                                |          |         |              | <b>Debris Rating- 4*</b>                    |          |         |              | <b>Debris Rating- 3*</b>                                  |          |         |              |
|                               | <b>Analytical Sensitivity: 14</b>                       |          |         |              | <b>Analytical Sensitivity: 14</b>                       |          |         |              | <b>Analytical Sensitivity: 14</b>           |          |         |              | <b>Analytical Sensitivity: 14</b>                         |          |         |              |
|                               | Few Pollen, Insects: ND, Particles: Many, Fibers: Many, |          |         |              | Mod Pollen, Insects: ND, Particles: Many, Fibers: Many, |          |         |              | Insects: ND, Particles: Many, Fibers: Many, |          |         |              | Few Pollen, Insects: Pres, Particles: Many, Fibers: Many, |          |         |              |
| Totals                        | 81  | 1158     | ~100%   | 1.2/1        | 47  | 672      | ~100%   | 1/1.4        | 141   | 2014     | ~100%   | 2.1/1        | 177   | 2528     | ~100%   | 2.6/1        |

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Lakewood, CO 80228  
Attn: Brandon Sinkbeil

**Client Project Name: Centennial-9/29/09**  
**Project ID: 095346**

Date Collected: 09/29/09  
Date Received: 09/30/09  
Date Reported: 10/01/09

Vertical Page 1 of 2      Horizontal Page 4

**Non-Viable Spore Trap Analysis**

|                               |   |                 |                |                     |
|-------------------------------|---|-----------------|----------------|---------------------|
| Client Sample Number          | 410-T Main  |                 |                |                     |
| Sample Location               | TC-Unit 410 Main Level                                  |                 |                |                     |
| Sample Volume (litres)        | 70  |                 |                |                     |
| Lab Sample Number             | 095346-013  |                 |                |                     |
| <b>Spore Identification</b>   | <b>Raw C</b>  | <b>Spore/m3</b> | <b>% Total</b> | <b>In/Out Ratio</b> |
| Alternaria                    | 5   | 71              | 3              | 2.4/1               |
| ascospores                    | 3   | 43              | 2              | 1.0/1               |
| basidiospores                 | 12  | 171             | 8              | 1.7/1               |
| Botrytis                      |   |                 |                |                     |
| Cladosporium                  | 25  | 357             | 17             | 1/1.3               |
| Drechslera/Bipolaris group    |   |                 |                |                     |
| hyphal elements               | 48  | 686             | 34             | 5.3/1               |
| Oidium                        |   |                 |                |                     |
| Penicillium/Aspergillus group | 6   | 86              | 4              | 1/1.8               |
| Peronospora                   |   |                 |                |                     |
| Pithomyces                    | 1   | 14              | 1              | -                   |
| rusts                         | 4   | 57              | 3              | -                   |
| smuts,Periconia,myxomycetes   | 36  | 514             | 25             | 17.7/1              |
| Torula                        |   |                 |                |                     |
| Trichocladium                 | 1   | 14              | 1              | -                   |
| Ulocladium                    |   |                 |                |                     |
| Ulocladium -like              | 2   | 29              | 1              | -                   |
| unknown                       |   |                 |                |                     |
| Comments                      | <b>Debris Rating- 4*</b>                                |                 |                |                     |
|                               | <b>Analytical Sensitivity: 14</b>                       |                 |                |                     |
|                               | Few Pollen, Insects: ND, Particles: Many, Fibers: Many, |                 |                |                     |
| Totals                        | 143   | 2042            | ~100%          | 2.1/1               |

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Vertical Page 2 of 2 Horizontal Page 1

### Non-Viable Spore Trap Analysis

#### Footnotes and Additional Report Information

##### Debris Rating Table

|   |   |  |
|---|---|--|
| 1 | Minimal (<5%) particulate present                       | Reported values are minimally affected by particulate load.  |
| 2 | 5% to 25% of the trace occluded with particulate        | Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded  |
| 3 | 26% to 75% of the trace occluded with particulate       |  |
| 4 | 76% to 90% of the trace occluded with particulate       |  |
| 5 | Greater than 90% of the trace occluded with particulate | Quantification not possible due to large negative bias. A new sample should be collected at a shorter time interval or other measures taken to reduce particulate load |

1. Penicillium/Aspergillus group spores are characterized by their small size, round to ovoid shape, being unicellular, and usually colorless to lightly pigmented. There are numerous genera of fungi whose spore morphology is similar to that of the Penicillium/Aspergillus type. Two common examples would be Paecilomyces and Acremonium. Although the majority of spores placed in this group are Penicillium, Aspergillus, or a combination of both; keep in mind that these are not the only two possibilities.

2. Ascospores are sexually produced fungal spores formed within an ascus. An ascus is a sac-like structure designed to discharge the ascospores into the environment. eg. Ascobolus

3. Basidiospores are typically blown indoors from outdoors and rarely have an indoor source. However, in certain situations a high basidiospore count indoors may be indicative of a wood decay problem or wet soil.

4. The Smut, Periconia, Myxomycete group is a group composed of three different groups whose spores have similar morphologies. Smuts are plant pathogens, Periconia is a relatively uncommon mold indoors, and Myxomycetes are not fungi but slime molds. Although these organisms do not typically proliferate indoors their spores are potentially allergenic.

5. The colorless group contains colorless spores which were unidentifiable to a specific genus. Examples of this group include Acremonium, Aphanocladium, Beauveria, Chrysosporium, Engyodontium microconidia, yeast, some arthrospores, as well as many others.

6. Rusts are plant pathogens that do not typically proliferate indoors unless an infected plant is present; their spores are potentially allergenic and reflect entrainment from outdoor air.

7. Hyphae are the vegetative mode of fungi. Hyphal elements are fragments of individual hyphae. They can break apart and become airborne much like spores and are potentially allergenic. A mass of hyphal elements is termed the mycelium. Hyphae in high concentration are indicative of colonization.

8. The positive-hole correction factor is a statistical tool which calculates a probable count from the total raw count, taking into consideration that multiple particles can impact on the same hole; for this reason the sum of the calculated counts may be less than the particle hole corrected total.

9. Due to rounding totals may not equal 100%.

10. Minimum Reporting Limits (MRL) for BULKS, DUSTS, SWABS, and WATER samples are a calculation based on the sample size and the dilution plate on which the organism was counted. Results are a compilation of counts taken from multiple dilutions and multiple medias. This means that every genus of fungi or bacteria recovered can be counted on the plate on which it is best represented.

#### Terminology Used in Direct Exam Reporting

Hyphae are the tubular filaments of the fungi. When seen on a surface samples in moderate to numerous concentrations they may be indicative of fungal growth.

Conidiophores are a type of modified hyphae from which spores are born. When seen on a surface sample in moderate to numerous concentrations they may be indicative of fungal growth.

Perithecial elements are intact or fragmented spore producing bodies produced by some ascomycetes such as Chaetomium and Ascotricha. Their presence on a surface sample may be indicative of growth.

Pycnidial elements are intact or fragmented spore producing bodies produced by some coelomycetes such as Phoma. Their presence on a surface sample may be indicative of growth.

Results relate only to the items tested



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